

WHAT IS CLAIMED IS:

1. A map generation device, comprising:
  - an image appointment unit that receives appointment of at least one position in a building existing within an aerial photograph;
  - a polygon extraction unit that extracts a building region based on a result of discriminating a color around the appointed position, and extracts a polygon line of the building region; and
  - a vector generation unit that generates a vector of the polygon line of the building region.
2. The map generation device according to claim 1, further comprising a roof texture analysis unit that analyzes colors around the appointed position to determine sample colors for matching, a discrimination threshold, and a region searching range,
  - wherein the polygon extraction unit extracts building region pixels based on a result of discriminating a similarity between a color of a roof of a building in the region searching range and the sample colors for matching, and extracts a line around the extracted building region pixels as the polygon line.
3. The map generation device according to claim 2, wherein the roof texture analysis unit extracts a plurality of pixels from a predetermined region including the appointed position, and determines the sample colors for matching, the discrimination threshold, and the region searching range

based on a result of statistically analyzing colors of the plurality of pixels.

4. The map generation device according to claim 3, wherein the roof texture analysis unit expands the region of the discrimination threshold and reduces the region searching range when a variance is large in the colors of the plurality of pixels extracted from the predetermined region including the appointed position.

5. The map generation device according to claim 1, wherein the polygon extraction unit extracts pixels largely different in color from adjacent pixels as edge pixels, determines boundary lines based on the edge pixels, expands the extracted building region to the boundary lines approximate to the building region to correct the building region.

6. The map generation device according to claim 1, wherein the polygon extraction unit rotates the building region so as to set the polygon line of the building region in a predetermined axis direction, and smoothes the polygon line.

7. The map generation device according to claim 1, further comprising a polygon correction unit that, in a case where the polygon line extracted by the polygon extraction unit corresponds to a predetermined linking pattern, corrects the polygon line to one of a straight line and lines crossing each other at a predetermined angle.

8. The map generation device according to claim 1, further comprising a structural analysis and integration unit that, in a case where a line of a building roof corresponds to a predetermined integration pattern, integrates the building region so as to include the line.

9. The map generation device according to claim 1, wherein the structural analysis and integration unit integrates the building region appointed by a plurality of inputted positions.

10. The map generation device according to claim 1, further comprising a ground projection unit that, in a case where the aerial photograph shows a building obliquely, corrects distortion due to a height of the building, and projects a building polygon shape on a ground.

11. A map delivery method, which is used to deliver a map by associating the map created by the map generation device according to any one of claims 1 with the aerial photograph.

12. A computer program product for generating a map, said computer program product comprising:

receiving appointment of at least one position in a building existing within an aerial photograph;

extracting a building region based on a result of discriminating a

color around the appointed position, and a polygon line of the building region; and

generating a vector of the polygon line of the building region.

13. The computer program product according to claim 12, further comprising:

analyzing colors around the appointed position to determine sample colors for matching, a discrimination threshold, and a region searching range;

extracting building region pixels based on a result of discriminating a similarity between a color of a roof of a building in the region searching range and the sample colors for matching, and

extracting a line around the extracted building region pixels as the polygon line.

14. The computer program product according to claim 12, further, comprising:

extracting pixels largely different in color from adjacent pixels as edge pixels and determining boundary lines based on the edge pixels;

expanding the extracted building region to the boundary lines approximate to the building region and correcting the building region.

15. The computer program product according to claim 12, further comprising:

rotating the building region so as to set the polygon line of the building region in a predetermined axis direction; and  
smoothing the polygon line after the rotation.

16. The computer program product according to claim 12, further comprising, in a case where the polygon line extracted by the polygon extraction unit corresponds to a predetermined linking pattern, correcting the polygon line to one of a straight line and lines crossing each other at a predetermined angle.

17. The computer program product according to claim 12, further comprising:

in a case where a line of a building roof corresponds to a predetermined integration pattern, integrating the building region so as to include the line; and

integrating the building region appointed by a plurality of inputted positions.

18. The computer program product according to claim 12, further comprising, in a case where the aerial photograph shows a building obliquely, correcting distortion due to a height of the building, and projecting a building polygon shape on a ground.